

Appl. No. 10/085,588

Amendments to the Specification

Please replace the title with the following replacement title:

Deposition Methods and Apparatus for Improved Delivery of Metastable Species

Please replace paragraph [0037] with the following replacement paragraph.

Numerous precursor materials can be utilized for purposes of the present invention including but not limited to H₂, TiCl₄, O₂, NO, TaF₅, NH₃ NH₃, trimethyl aluminum (TMA), SiH₄, O₃, and tetrakis(dimethylamino) titanium (TDMAT). Accordingly, numerous metastable species of precursor materials can be generated.

Please replace paragraph [0040] with the following replacement paragraph.

When deposition system 10 comprises an atomic layer deposition system, deposition chamber 12 can be purged after flowing the activated hydrogen and prior to any subsequent flowing of precursor material. After adsorption of at least some of the activated hydrogen onto substrate 26, a second precursor material, for example TiCl₄, can be flowed into deposition chamber 12 and at least some of the second precursor can be adsorbed onto substrate 26 to react with the previously adsorbed adsorbed activated hydrogen to form layer 46.

Please replace the abstract with the following replacement abstract.

Appl. No. 10/085,588

ABSTRACT OF THE DISCLOSURE

The invention includes a deposition system having a reservoir for containment of a metastable specie connected to a deposition chamber. The system includes a metastable specie generating catalyst within the reservoir. The invention also includes an atomic layer deposition apparatus having a substrate platform within a deposition chamber that contains a substrate platform, ~~first and second~~ inlets and a dispersion head positioned between the inlets and the substrate platform. The ALD apparatus includes first and second metastable specie containment reservoirs in fluid communication with the deposition chamber through the inlets. One or more sources of carrier gas are configured to deliver carrier gas through at least one of the inlets. The invention also includes an atomic layer deposition method. A metastable specie is generated and is contained in a pre-chamber reservoir. The metastable specie is flowed from the reservoir into the chamber and at least a portion of the metastable specie is deposited onto a substrate.